REMARKS

Claims 1-4, 6-14 and 20-36 are pending, with claims 1, 10, 22 and 30 being independent. Claims 1, 10, 22 and 30 have been amended to recite "first and second introducing ports" (claims 1 and 22) or "first and second gas inlet ports" (claims 10 and 30) arranged "so that a first flow of gas is introduced by the first ... port in a direction parallel to and along the first direction, a second flow of gas is introduced by the second ... port in a direction parallel to and opposite to the first direction, and the first and second flows of gas are rectified in a direction away from a film formation surface of the substrate and toward the apertures so as to prevent particles with diameters greater than a thickness of a film to be formed on the substrate from being deposited on the film formation surface of the substrate." In addition, claims 1, 10, 22, 27 and 30 have been amended to consistently recite a substrate support. Support for the amendments is discussed below. No new matter has been introduced.

Initially, applicant thanks the Examiner for the personal interview granted to the undersigned on February 9, 2009. The substance of the interview is reflected in the remarks below.

The claims have been rejected under section 112, first paragraph. In the rejection, the Examiner states that the specification

> "fails to describe a plasma CVD apparatus having an introducing port for gas, a substrate support and a first electrode arranged relative to one another so that a flow of gas introduced by the introducing port into the chamber **is rectified in a direction toward the apertures so that the flow of gas does not gradually contain a portion** that: (1) flows toward the substrate and (2) includes particles with diameters greater than a thickness of a film to be formed on the substrate, as required by the independent claims."

While, as discussed at the interview, applicant respectfully disagrees that the specification does not provide support for the claims as previously presented, the claims have been further amended as discussed at the interview in order to address the Examiner's concerns. As noted above, the claims now recite first and second ports arranged "so that a first flow of gas is introduced by the first ... port in a direction parallel to and along the first direction, a second flow of gas is introduced by the second ... port in a direction parallel to and opposite to the first

direction, and the first and second flows of gas are rectified in a direction away from a film formation surface of the substrate and toward the apertures so as to prevent particles with diameters greater than a thickness of a film to be formed on the substrate from being deposited on the film formation surface of the substrate." These features find support in the application at FIG. 4 (which shows the two ports introducing first and second flows in opposite directions that are both parallel to the direction in which the substrate moves) and in the specification at, for example, page 5, lines 1-15; page 6, lines 11-16; and page 9, lines 8-15. In particular, at page 5, lines 1-15, the application describes a prior technique in which

> "a gas flow parallel to a substrate 301 on which a film is to be formed ... ***gradually contains a flow 306 toward the substrate 301*** due to turbulence of the gas flow while moving over a long distance between the substrate 301 and a discharge electrode 303. Fine ***particles*** generated in a discharge space 304 or fragmental particles generated by exfoliation of the film deposited on the discharge electrode 303 ***move along the gas flow. A part of the particles flow in the direction of the substrate 301 due to turbulence or diffusion of the gas flow to adhere onto the substrate 301.***"

Thus, this passage describes as detrimental a gas flow that includes a portion that flows toward the substrate and includes particles that adhere to the substrate.

At page 6, lines 11-16, the application notes that

> "In a film formation chamber, ***a gas flow to be introduced is rectified in a direction away from a film formation surface of the substrate on which the film is to be formed,*** so that fine particles generated in a discharge space and fragmental particles generated by exfoliation of the film from the wall of the vacuum chamber or the discharge electrode are exhausted along with the gas flow, ***thereby preventing the particles from adhering onto the film formation surface of the substrate on which the film is to be formed.*** The fine particles or the fragmental particles are sucked from a plurality of apertures provided on the entire surface of the discharge electrode to be exhausted so as to establish a steady state in which the amount of a film deposited onto the discharge electrode is equal to that of an exfoliating film to be exhausted. As a result, continuous film formation is made possible without cleaning the discharge electrode over a long period of time."

Thus, this passage describes that the gas flow is rectified in a direction away from the film formation surface of the substrate and toward the apertures to prevent the particles from adhering onto the film formation surface.

At page 9, lines 8-15, the application notes that

> ***The present invention targets on fine particles and fragmental particles having a diameter larger than a film thickness*** of electronic devices of interest such as a solar battery, which are introduced into the film to affect the characteristics. The fine particles and fragmental ***particles*** move due to inertial force and gravity caused by a gas flow and ***are prevented from adhering onto a film formation surface of a substrate by rectifying the gas flow in a direction going away from the film formation surface of the substrate*** and by downwardly placing the film formation surface of the substrate so that the fine particles and fragmental particles are not deposited onto the film formation surface due to gravity. In the present invention, relatively small particles, in which the effects of Brownian diffusion and electrostatic force are more dominant than those of inertial force and gravity, such as monomers having a similar size to that of molecules of a material gas and clusters formed by cohesion of several molecules, reach and are deposited onto the substrate on which a film is to be formed, a wall of a film formation chamber and a surface of a discharge electrode due to diffusion of particles, So that a film is formed on the substrate, the wall of a film formation chamber and the surface of a discharge electrode.

Thus, this passage describes that particles with diameters greater than the film thickness are rectified away from the substrate so as to prevent them from being deposited on the film formation surface.

The three passages described above, in conjunction with the detailed description of the arrangement of the introducing ports, the substrate support and the electrode, provide sufficient written description of a plasma CVD apparatus having two ports, a substrate support and an electrode arranged relative to one another "so that a first flow of gas is introduced by the first ... port in a direction parallel to and along the first direction, a second flow of gas is introduced by the second ... port in a direction parallel to and opposite to the first direction, and the first and second flows of gas are rectified in a direction away from a film formation surface of the substrate and toward the apertures so as to prevent particles with diameters greater than a thickness of a film to be formed on the substrate from being deposited on the film formation surface of the substrate," as recited in each of the independent claims. Accordingly, the rejection under section 112, first paragraph, should be withdrawn.

The claims also have been rejected under section 112, second paragraph. Applicant requests reconsideration and withdrawal of this rejection in view of the amendment of the independent claims to remove "gradually," the term which the Examiner appeared to find unclear.

Claims 1-4, 6-14, 26, 27 and 35 have been rejected as being unpatentable over the admitted prior art in view of Izu (U.S. Patent No. 4,410,558) or Sando (U.S. Patent No. 4,479,369), and claim 20-24, 28-34 and 36 have been rejected as being unpatentable over admitted prior art in view of Izu or Sando, Komino (U.S. Patent No. 6,156,151) and Yamazaki (U.S. Patent No. 4,808,553).

With respect to claim 1 and its dependent claims, applicant requests reconsideration and withdrawal of this rejection because, as discussed at the interview, neither the admitted prior art, Izu, Sando, Komino, Yamazaki, nor any proper combination of these references describes or suggests "first and second introducing ports" arranged "so that a first flow of gas is introduced by the first introducing port in a direction parallel to and along the first direction, a second flow of gas is introduced by the second introducing port in a direction parallel to and opposite to the first direction, and the first and second flows of gas are rectified in a direction away from a film formation surface of the substrate and toward the apertures so as to prevent particles with diameters greater than a thickness of a film to be formed on the substrate from being deposited on the film formation surface of the substrate," as recited in claim 1.

As discussed at the interview, the admitted prior art only includes a single introducing port that introduces a flow of gas in a first direction. Accordingly, the admitted prior art does not describe or suggest introducing first and second flows of gas in opposite directions, both of which are parallel to the direction in which the substrate moves.

As also discussed at the interview, the other references are similarly deficient. Izu, in FIG. 3, shows two introducing ports 52 that introduce gas in opposite directions that are perpendicular to the direction in which the substrate moves. Sando, in FIG. 1, discloses a single introducing port 6 that introduces gas in a direction perpendicular to both a surface of the substrate and the direction in which the substrate moves. Komino and Yamazaki are cited for other purposes and also fail to disclose these features.

Accordingly, for at least these reasons, the rejection of claim 1 and its dependent claims should be withdrawn.

Similarly to claim 1, independent claims 10, 22 and 30 recite first and second gas inlet ports (claims 10 and 30) or first and second introducing ports for gas (claim 22) arranged relative to other components "so that a first flow of gas is introduced by the first ... in a direction parallel

to and along the first direction, a second flow of gas is introduced by the second ... port in a direction parallel to and opposite to the first direction, and the first and second flows of gas are rectified in a direction away from a film formation surface of the substrate and toward the apertures so as to prevent particles with diameters greater than a thickness of a film to be formed on the substrate from being deposited on the film formation surface of the substrate." Accordingly, the rejection of these claims and their dependent claims should be withdrawn for at least the reasons discussed above with respect to claim 1.

Applicant submits that all claims are in condition for allowance.

The $490 fee for the two-month extension of time is being paid concurrently herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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